[0016] FIG. **2***f* is a perspective view of an electroactive polymer structure in a cylindrical structure that provides axial motion of the element;

[0017] FIG. **3** is a perspective view of an example mouse interface device suitable for use with EAP actuators;

[0018] FIG. **3***a* is a side elevational view of a mouse embodiment in which a button is moved in its degree of freedom by an electroactive polymer actuator;

[0019] FIG. **3***b* is a top plan view of a mouse embodiment in which a button is moved laterally by an electroactive polymer actuator;

[0020] FIG. **3***c* is a top plan view of a mouse embodiment in which a button includes an array of multiple electroactive polymer actuators;

[0021] FIG. **4***a* is a schematic view of an embodiment in which an inertial mass is moved linearly by an electroactive polymer actuator to provide inertial sensations;

[0022] FIG. **4***b* is a schematic view of an embodiment in which an inertial mass is moved rotationally by an electroactive polymer actuator to provide inertial sensations;

[0023] FIG. **4***c* is a view of an embodiment in which multiple inertial masses are moved by an electroactive polymer actuators;

[0024] FIG. **5***a* is a side view of a mouse embodiment in which a entire cover portion of the mouse is moved by an electroactive polymer actuator to provide tactile sensations;

[0025] FIG. **5***b* is a top plan view of a mouse embodiment in which side portions of the mouse are moved by an electroactive polymer actuator to provide tactile sensations;

[0026] FIG. **5***c* is a top plan view of a mouse embodiment in which top portions of the mouse are moved by an electroactive polymer actuator to provide tactile sensations;

[0027] FIG. **5***d* is a side view of a mouse embodiment in which a rear top portion of the mouse is moved by an electroactive polymer actuator to provide tactile sensations;

[0028] FIG. **6** is a top view of an embodiment in which a sphere is braked by an electroactive polymer actuator;

[0029] FIG. **7***a* is a side view of a wheel embodiment in which a rotatable wheel includes an inertial mass that is rotationally moved by an electroactive polymer actuator;

[0030] FIGS. **7***b* and **7***c* illustrate a wheel embodiment including a number of electroactive polymer actuators which expand in area;

[0031] FIG. **7***d* is a perspective view of a wheel embodiment in which a rotatable wheel is braked by an electroactive polymer actuator;

[0032] FIG. **7***e* is a side elevational view of a wheel embodiment in which the entire rotatable wheel is moved laterally and vertically by electroactive polymer actuators;

[0033] FIG. **8***a* is a perspective view of a trackpoint controller in which an electroactive polymer actuator provides haptic feedback in its degrees of freedom;

[0034] FIGS. **8***b* and **8***c* is perspective and side sectional views of a trackpoint controller in which an electroactive polymer actuator provides haptic feedback by linearly moving a poker against the user;

[0035] FIG. **8***d* is a perspective view of a trackpoint controller in which electroactive polymer actuators provide haptic feedback in linear degrees of freedom;

[0036] FIG. **9***a* is a perspective view of a vertical pin moved linearly by an electroactive polymer actuator against a user's finger;

[0037] FIGS. **9***b* and **9***c* are perspective views of arrays of the vertical pins of FIG. **9***a;*

[0038] FIGS. **9***d* and **9***e* are side views of a vertical pin moved laterally by an electroactive polymer actuator against a user's finger;

[0039] FIG. **10** is a side elevational view of a device in which an electroactive polymer actuator provides braking forces on a medical tool;

[0040] FIG. **11** is a side elevational view of a device in which an electroactive polymer actuator provides forces to a trigger on an interface device;

[0041] FIG. **12***a* is a front view of a knob in which an electroactive polymer actuator provides direct rotary forces in the rotary degree of freedom of the knob;

[0042] FIG. **12***b* is a perspective view of a knob in which an electroactive polymer actuator provides braking forces in the rotary degree of freedom of the knob;

[0043] FIG. **13** is a side view of a rotating disc in which an electroactive polymer actuator provides braking forces in the rotary degree of freedom of the disc;

[0044] FIG. **14***a* is a side elevational view of a stylus in which an electroactive polymer actuator provides linear forces to the tip of the stylus;

[0045] FIG. **14***b* is a side elevational view of a stylus in which an electroactive polymer actuator provides linear forces to the front end of the stylus;

[0046] FIG. **14***c* is a side elevational view of a stylus in which an electroactive polymer actuator provides forces to a button on the stylus;

[0047] FIGS. **14***d* and **14***e* are side elevational and perspective views of a stylus in which electroactive polymer actuators provide outward forces from the stylus body;

[0048] FIG. **15***a* is a front view of a steering wheel in which an electroactive polymer actuator provides inertial forces;

[0049] FIG. **15***b* is a side view of a joystick handle in which an electroactive polymer actuator provides inertial forces;

[0050] FIGS. **15***c* and **15***d* are perspective and side elevational views of a joystick handle in which electroactive polymer actuators provide braking forces in the degrees of freedom of the joystick handle;

[0051] FIG. **16** is a perspective view of a rotating cylinder controller in which electroactive polymer actuators provide braking forces in the degrees of freedom of the cylinder;

[0052] FIG. **17***a* is a side elevational view of a tactile element in which electroactive polymer actuators provide linear motion to the element; and

[0053] FIG. **17***b* is a side elevational view of a tactile element in which electroactive polymer actuators provide lateral, shear motion to the element.

DETAILED DESCRIPTION

[0054] FIG. **1** is a block diagram illustrating a haptic feedback system suitable for use with any of the described embodiments. The haptic feedback system includes a host computer system **14** and interface device **12**.

[0055] Host computer system **14** preferably includes a host microprocessor **100**, a clock **102**, a display screen **26**, and an audio output device **104**. The host computer also includes other well known components, such as random access memory (RAM), read-only memory (ROM), and input/output (I/O) electronics (not shown).

[0056] Host computer **14** can be a personal computer or workstation and may operate under any well-known operating system. Alternatively, host computer system **14** can be one of a variety of home video game console systems commonly connected to a television set or other display, such as